

further southward, over Algeria, on the 24th. As the two latter storms moved northward, they were accompanied by very severe and destructive gales over the whole of western Europe. *South Atlantic and Indian Oceans*.—The following reports probably refer to the same storm, the centre of which evidently moved eastward at a short distance to the south of the positions on the dates named; *September 28th, 1878*, lat. 37° 41' S., long. 0° 13' W., terrific cyclone; 30th, 40° 30' S., 25° 20' E., hurricane from NNW., veering to W. and SW., lasting 20 hours; *Oct. 5th*, 38° 11' S., 59° E., hurricane from NE., NNW. and SSW., lasting three days. *Pacific Ocean*.—Storms moved in the directions indicated by the tracks Nos. I, II, III and IV on the dates named, but reports are too meagre to determine the positions of their centres with any degree approaching accuracy. No. IV was accompanied by a northerly gale and heavy rain on *Feb. 23rd*, at Yokohama; barometer at 11:30 a. m., 28.97 inches. *South Pacific Ocean*.—*May 6th and 7th, 1878*, severe hurricane passed over Paumotu Islands, (17° S., 143° W.) "by which 150 lives were lost, and \$250,000 worth of property destroyed." *December, 9th, 1878*, 3° 52' S., 167° 31' W., bar. 29.77, E. gale; 13th, 22° 17' S., 174° 36' W., bar. 29.85, E. to N. gale, squally, heavy rain; 27th and 28th, Sydney harbor, New South Wales, bar. 29.56 to 29.83, cloudy and rainy weather, followed by SSE. squalls. *January 30th, 1879*, 33° 53' S., 152° 16' E., bar. 29.73, N. Gale. *Southern Ocean*.—*May 4th, 1878*, 47° S., 110° E., 10 p. m., barometer fell to 28.76, with terrific NNW. gale and tremendous sea. *May 12th to 18th, 1878*, very heavy W. gale off south coast of New Zealand, the barometer falling to 28.40 on the 17th. *Indian Ocean*.—*December 12th, 1878*, 12° 55' S., 99° 45' E., "cyclone," wind veering from ESE. to S. and SW., lasting 24 hours. Ship "Lady Palmerston," from Calcutta, Nov. 29th, and Sand Heads, Dec. 1st, 1878, experienced a "cyclone" in the Indian Ocean lasting seven days, and rounded Cape of Good Hope *January 25th, 1879*. *January 24th, 1879*, a "cyclone," traveling southward, was probably central about 23° S., 67° E., at midnight of the above date; it was encountered by ships "John R. Worcester" and "Paul Jones." *February 26th, 1879*, "a cyclone" passed southward east of Mauritius during the morning; at this place the wind backed from ESE. to WSW. and attained a mean hourly velocity of 63 miles from 10.30 to 11.30 a. m.; the barometer, which had been slowly falling from the 22nd to the 25th, fell very rapidly on the morning of the 26th, and reached its minimum, 29.183, (corrected and reduced,) at 11.40 a. m.; rainfall, 2.54 inches. "Lloyd's agent at Freemantle, western Australia, reports that three vessels were wrecked during hurricane (no date) at Lacepedes, vessels total loss, crews saved." *Cerro de Pasco, Peru*.—Dr. Geo. A. Ward, in forwarding meteorological reports from Pasco, gives the altitude of station as 14,400 feet above sea-level; he states that the storms of that neighborhood are exceedingly local in their effects, usually being of short duration and accompanied by much electricity. Earthquakes occasionally occur, and those reported will be found under the special heading near the end of this REVIEW. A "frosty fog" often occurs, which is considered to be productive of pulmonary diseases. The observations consist of temperatures, (taken at irregular hours,) and various meteorological notes for the months of May, June, August, September, October, November and December, 1878. The following table gives the highest and lowest temperatures and number of days on which rain or snow and frosts were observed each month:

| DATE.          | TEMPERATURES. |      |              |      | No. OF DAYS.  |         |
|----------------|---------------|------|--------------|------|---------------|---------|
|                | Hour.         | Max. | Hour.        | Min. | Rain or snow. | Frosts. |
| 1878—May.....  | 4 p. m...     | 60°  | 7 a. m...    | 26°  | 5             | 7       |
| June.....      | 4:15 p. m...  | 44°  | 6 a. m...    | 26°  | 7             | 8       |
| August.....    | 9 a. m...     | 66°  | 6:40 a. m... | 27°  | 5             | 7       |
| September..... | 1:15 p. m...  | 56°  | 6:20 a. m... | 36°  | 9             | 3       |
| October.....   | 12:30 p. m... | 58°  | 6:05 a. m... | 34°  | 15            | 5       |
| November.....  | 11:15 a. m... | 57°  | 7 a. m...    | 32°  | 21            | 3       |
| December.....  | 3:50 p. m...  | 57°  | 6 a. m...    | 32°  | 19            | 7       |

### TEMPERATURE OF THE AIR.

The isothermal lines upon chart No. II show the general distribution of the temperature of the air for the month. By a reference to the table of average temperatures upon the same chart it will be seen that the temperature for the present month averages above that for several years in all the districts, especially throughout the elevated country between the Mississippi valley and the Sierra Nevada Mts.; Salt Lake City and Pike's Peak, unusually high.

*Minimum and Maximum Temperatures*, respectively, are for *Maine*—at Portland, 10° and 55°; Gardiner, —7°, 45°; Eastport, 4°, 44°. *New Hampshire*—Mt. Washington, —10°, 35°; Dunbarton, —5°, 55°. *Vermont*—Burlington, 0°, 50°; Woodstock, —10°, 55°. *Massachusetts*—Westborough, 10°, 62°; Williamstown, 3°, 51°; Boston, 8°, 61°. *Rhode Island*—Newport, 16°, 55°. *Connecticut*—Mystic, 12°, 62°; New London, 15°, 55°. *New York*—Plattsburg Bks., —6°, 44°; Starkey, —2°, 72°; Buffalo, 13°, 64°; New York city, 29°, 72°; Schroon Lake, —12°, 52°; Nile, 0°, 60°. *New Jersey*—Princeton, 13°, 65°; Atco, 22°, 71°.

*Pennsylvania*—Tioga, 8°, 64°; Pittsburg, 19°, 77°; Philadelphia, 19°, 69°; Westchester, 15°, 67°; Tarentum, 14°, 74°; Egypt, 13°, 64°. *Delaware*—Dover, 24°, 66°. *Maryland*—Woodstock, 14°, 70°; Emmittsburg, 15°, 76°. *District of Columbia*—Washington, 21°, 75°. *Virginia*—Broad Oak, 20°, 82°; Norfolk, 29°, 79°. *West Virginia*—Helvetia, 22°, 72°; Morgantown, 23°, 74°. *North Carolina*—Highlands, 18°, 67°; Weldon, 27°, 84°. *South Carolina*—Aiken, 29°, 80°; Charleston, 35°, 78°. *Georgia*—Savannah, 38°, 85°; Atlanta, 31°, 79°. *Florida*—Jacksonville, 44°, 86°; Key West, 66°, 83°. *Alabama*—Mobile, 39°, 85°; Montgomery, 33°, 85°. *Mississippi*—Vicksburg, 32°, 84°; Brookhaven, 32°, 80°. *Louisiana*—New Orleans, 45°, 84°; Baton Rouge Bks., 36°, 89°. *Texas*—Denison, 26°, 92°; Concho, 27°, 97°; Galveston, 45°, 85°; Clarksville, 36°, 94°; Austin, 38°, 89°; Melissa, 28°, 94°. *Ohio*—Jacksonburg, 14°, 78°; Westerville, 3°, 71°; Cincinnati, 18°, 74°. *Kentucky*—Louisville, 22°, 79°; Bowling Green, 20°, 82°. *Tennessee*—Memphis, 26°, 85°; Nashville, 22°, 81°. *Arkansas*—Mt. Ida, 21°, 88°. *Michigan*—Escanaba, —10°, 57°; Alpena, —8°, 66°; Detroit, 14°, 67°. *Indiana*—Spiceland, 10°, 72°; New Harmony, 16°, 78°. *Illinois*—Peoria, 5°, 74°; Chicago, 16°, 71°; Anna, 21°, 86°. *Missouri*—Oregon, 4°, 89°; St. Louis, 16°, 82°. *Kansas*—Morse, 2°, 84°; Holton, 8°, 90°; Topeka, 4°, 92°. *Wisconsin*—Embarrass, —6°, 65°; Madison, 5°, 68°; La Crosse, 1°, 67°. *Iowa*—Vail, —3°, 80°; Dubuque, 7°, 71°; Des Moines, 1°, 79°. *Nebraska*—Genoa, —1°, 77°; Emerson, 5°, 96°; Omaha, 31°, 82°. *Indian Territory*—Fort Sill, 21°, 95°; Fort Gibson, 24°, 88°. *Minnesota*—Duluth, —14°, 62°; Breckenridge, —24°, 69°. *Dakota*—Pembina, —26°, 52°; Yankton, —3°, 87°; Deadwood, —5°, 71°. *Colorado*—Colorado Springs, 12°, 77°; Denver, 17°, 81°; Pike's Peak, —4°, 43°. *New Mexico*—Santa Fe, 25°, 82°; Fort Union, 10°, 77°. *Wyoming Territory*—Cheyenne, 8°, 77°; Ft. Fetterman, 6°, 79°. *Montana*—Virginia City, 14°, 68°. *Utah*—Salt Lake City, 28°, 77°; Ft. Douglass, 25°, 80°; Kanab, 43°, 86°. *Nevada*—Winnemucca, 16°, 82°; Pioche, 25°, 77°. *Arizona*—Florence, 37°, 95°; Tucson, 39°, 90°; Phoenix, 43°, 94°. *Idaho*—Boise City, 27°, 75°. *California*—San Francisco, 47°, 77°; Los Angeles, 42°, 99°; Sacramento, 38°, 75°; San Diego, 44°, 99°; Red Bluff, 38°, 82°; Visalia, 38°, 91°; Princeton, 40°, 85°; Salinas, 32°, 80°. *Oregon*—Portland, 33°, 73°; Eola, 32°, 76°.

*Ranges of Temperature.*—The monthly ranges will appear from an examination of the minima and maxima just given. Greatest daily ranges vary in New England from 20° at Wood's Holl to 36° at Burlington; Middle States, 23° at Cape May to 36° at New York, Washington and Lynchburg; South Atlantic States, 20° at Cape Lookout to 38° at Augusta; Gulf States, 12° at Key West to 24° at Galveston, 26° at Mobile, 32° at St. Marks and Vicksburg and 39° at Corsicana; western Texas, 28° at Laredo to 45° at Mason and Fort Concho; Ohio valley and Tennessee, 26° at Cairo to 43° at Knoxville and 40° at Pittsburg; Lower Lake region, 26° at Buffalo and Erie to 33° at Sandusky; Upper Lake region, 28° at Port Huron to 41° at Escanaba; the Northwest, 28° at Davenport to 43° at Breckenridge and Pembina and 49° at Yankton; Eastern Slope, 41° at Fort Sill to 47° at North Platte; Rocky Mountain stations, 27° at Virginia City to 47° at Santa Fé and 51° at Fort Craig; Western Plateau, 30° at Boise City to 48° at Winnemucca; California, 21° at San Francisco to 43° at San Diego; Oregon, 26° at Portland.

*Frost*—has occurred quite frequently over the northern sections of the country; in the interior of the Southern States and Texas from the 1st to 5th, 15th to 20th, 24th, 25th, 31st; along the immediate Gulf coast on the 4th, 12th, 18th, 19th, 22nd; Campo, Cal., 1st, 2nd, 4th, 5th, 11th, 12th; Umatilla, Or., 1st, 3rd, 13th, 14th, 21st; Portland, Or., 1st, 5th, 13th; Victoria, B. C., 5th, 7th, 21st. Not any reports have been received of destructive frosts during the month.

*Frost out of Ground.*—Riley, Ill., 25th; Woodstock, Md., 22nd; Fallston, Md., 20th.

*Ground frozen.*—Murphy, N. C., 31st; Waltham, Mass., 31st, two feet deep.

*Ice*—formed in the Gulf and South Atlantic States as follows: Denison, Tex., 17th; Okalooska, La., 18th, 19th; Charlotte, N. C., 18th; Fayette, Miss., 18th; Augusta, Ga., 2nd.

## PRECIPITATION.

The general distribution of the rainfall, which includes melted snow, for the month is illustrated as accurately as possible upon chart No. III. In the lower left-hand corner of same will be found a table giving average precipitation of March by districts. Slight excesses have occurred in the St. Lawrence valley and New England; and large excesses from eastern Washington Ty. to the northern half of California, due to the frequency of low pressure areas. It has been about normal in Minnesota and the Ohio valley. In the remaining sections there has been a deficiency; especially in the South Atlantic and Gulf States, over which a general storm has not passed during the month. The rainfall of 0.83 in. at Tucson, Arizona, was received after the preparation of the chart.

*Special Heavy Rains.*—4th and 5th, San Francisco, 4.80 inches; Red Bluff, 3.07 in.; Sacramento, 2.38 in. 9th and 10th, Eola, Or., 2.20 in. 12th and 13th, New Ulm, Tex., 2.94 in. 13th, Ft. Barrancas, Fla., 1.75 in. 19th, Ft. Barrancas, Fla., 3.65 in. 21st, Mobile, 4.20 in., (in 9 hours.) 22nd, White Plains, N. Y., 2.20 in. 23rd and 24th, Eola, Or., 1.99 in. 23rd to 25th, Ft. Stevens, Or., 8.05 inches. 26th and 27th, White Plains, N. Y., 2.30 in. 26th, Melissa, Tex., 3.50 in., (in 3 hours.) 27th to 29th, Ft. Stevens, Or., 4.40 inches.

*Largest Monthly Rain-falls.*—Fort Stevens, Or., 22.60 inches; Olympia, Wash. Ty., 14.44; Cape Hatteras, 12.77; Portland, Or., 11.70; Fort Canby, Wash. Ty., 10.92; Eola, Or., 10.66; San Francisco, Cal., and Fayetteville, N. C., 8.75; Roseburg, Or., 8.60; Mt. Washington, 7.51; Cape Henry, 7.47; St. Meinrad, Ind., 7.23; Ft. Barrancas, Fla., 7.14; Newport, 6.18.

*Smallest Monthly Rain-falls.*—Kit Carson and Ft. Lyon, Col., Ft. Union and Ft. Craig, N. M., Ft. Wallace, Kan., Hamilton, Nev., St. George, Utah, none; Ft. Hays and Waterville, Kan., trace; Ft. Davis, Tex.,